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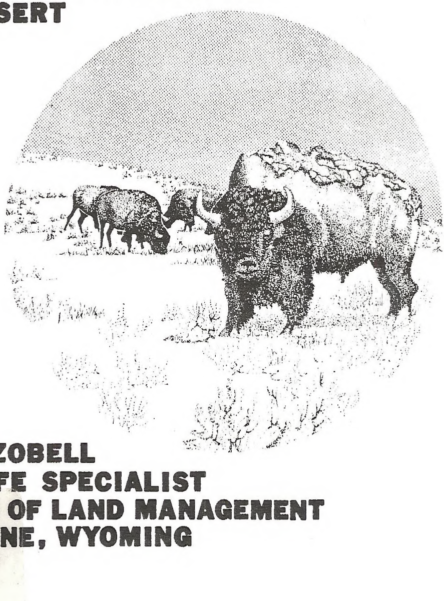
ANALYSIS TO CONSIDER TRANSPLANTING BUFFALO INTO WYOMING'S RED DESERT



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Central Mountains and Plains Section
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"Analysis to Consider Transplanting Buffalo into Wyoming's Red Desert"

Abstract: Some of the last reported wild herds of buffalo, Plains bison (Bison bison bison), were reported from Wyoming's Red Desert. Buffalo were found on the desert as recent as 1965; but have since disappeared. Requests were made in the past to consider transplanting buffalo into the Red Desert. Present requests are being evaluated. Information indicates that buffalo are not threatened or endangered, but are being maintained in several public and private herds. Free ranging buffalo may be observed in herds such as at Yellowstone Park, Henry Mountains of Utah, and in Wood Buffalo Park in Canada; and there are numerous private herds. Buffalo are susceptible to most diseases common to domestic livestock, such as brucellosis, tuberculosis, leptospirosis, anthrax, pneumonia, and several common parasites. All forage in the Red Desert is presently allocated to domestic livestock and wildlife. It is the home of some of the largest herds of pronghorn antelope in the world. There are numerous problems associated with free ranging buffalo and other uses of range lands. Much information about buffalo is based on handed down stories; there has been very few scientific studies on them.

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The Bureau of Land Management (BLM) received requests in 1971 to establish a free ranging herd of 1000 buffalo in the Red Desert area to provide sport hunting. To analyze the requests, background and historical information, data about the animal itself, and management implications were gathered. These requests are being handled through the BLM's planning system and an environmental analysis.

Previous requests were made to consider transplanting buffalo. In 1962 a representative of the Wyoming Wildlife Federation proposed a "Wild Range" in the Red Desert to Senator McGee; one part of the request was the establishment of a buffalo herd. This request was analyzed by an interagency group; their report was unfavorable. Informal contacts in 1967 by individuals discussed buffalo. In 1968, the Wyoming Outdoor Coordinating Council proposed the establishment of a "National Antelope Range" for parts of the Red Desert; the consideration of buffalo was implied.

General Information on Buffalo

Buffalo are closely related to domestic cattle. Buffalo is one common name, but bison is a more correct name. Both common names are used in this paper. A number of races have been identified, but generally three were recognized -- the plains buffalo, a larger wood buffalo, and a smaller mountain buffalo (BSF&W Cons. Note 12, 1965). However, today only two are generally recognized; wood buffalo (*Bison bison athabascae* Rhoads) which is larger and darker than the plains variety; and the plains buffalo (*Bison bison bison*); some writers list them as (*Bison bison*) (Banfield and Novakowski, 1960; Fuller, 1966). In Wyoming the two races often mixed. The Yellowstone Park herd, originally

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wood buffalo, was mixed with the plains buffalo by introduction, and now the herd is a hybrid mixture (Meagher, 1970). The Red Desert country is at the edge of the plains and wood buffalo's ancestorial range, Wyoming is west of the principal range of the plains buffalo. Most herds in the U.S. are remnants of the plains buffalo.

Buffalo Historical Information

Historical reports indicate that there were uncounted millions of buffalo in North America (Cahalane, 1947; BSF&W Cons. Note 12, 1965). Recent population estimates indicate a continental population of approximately 22,000 bison (BSF&W Cons. Note 12, 1965). However, this appears to be a low estimate. Canada has 15,000 in one herd, and herds of a few hundred head in several national parks (Novakowski, 1971), and the National Buffalo Association members report 15,000 bison (Roe, 1951; Houck, 1971). It appears the present population is large enough to assure the well-being of the American buffalo in the foreseeable future (BSF&W Cons. Note 12, 1965). The buffalo is not listed in the Fish and Wildlife Service's "Red Book" report on threatened wildlife species. Much historical literature about bison is based on hearsay handed down; scientific studies are limited (Nelson, 1965). The following table indicates estimated population changes in buffalo:

Date	Population estimates	Reference
Pre-1800	Uncounted millions	Cahalane (1947)
	160,000,000	Seaton (1927)
	60-70 million	BSF&W (1965)
1830	40 million	Roe (1951)
		BSF&W (1965)
1840	35,650,000	Roe (1951)
1870	5½ million	BSF&W (1965)

1880	395,000	Roe (1951)
1889	541 in U.S.	Hornaday (1904)
1900	300 in U.S.	BSF&W (1965)
1902	Marked start of restoration efforts with buffalo in private herds and Yellowstone Park; several bison ranges were later established. The largest group is in the Wood Buffalo Park in Northern Canada which was established in 1922	
1944-47	5,000 in U.S.	Cahalane (1947)
	15,000 in Canada	Roe (1951)
1951	23,340	Collins (1959)
1960	20,000-22,000 in U. S.	BSF&W (1965)
1970	2,759 in Wyoming	ARS (1970)
1971	2,941 in federal herds in Cont. U.S.	Nelson (1971)
1972	29,185	McHugh (1972)

In 1521 Cortez was the first white man to see a buffalo (Roe, 1951). Buffalo formerly ranged over most of the U.S., favored habitat was the plains, more particularly the eastern edge of the short grass prairie. Fremont and others mentioned buffalo in the area of the Red Desert (Roe, 1951). Emigrants reported buffalo to be common in Wyoming from Independence Rock to South Pass, explorers seldom reported buffalo beyond South Pass. In February 1847, a buffalo archery hunt was conducted at Rawlins, Wyoming, but rifles were required to make the kills (Roe, 1951). A February 1889 letter to Wyoming's Senator Carey, reported a band of 26 head of buffalo in the Red Desert of Wyoming (Roe, 1951; Hornaday, 1904); this was apparently the last known wild herd in the U.S. outside sanctuaries.

The systematic reduction of buffalo can be associated with settlement. It was said that the cow and the plow spelled the end of the buffalo on the plains after the decision to control the Indians. Buffalo reduction started in 1830 and was essentially completed by 1885. There was also some market hunting for meat, tongues and hides; in 1872 there were an estimated 1,640,000 hides in a railroad shipping shed in Cheyenne (Roe, 1951). In the early 1960's there were unconfirmed reports of 15 buffalo in the Picket Lake area in the Red Desert; they have since disappeared.

Status of Buffalo in Wyoming as a Game Animal

In Wyoming buffalo are classified as wildlife, but not as a game animal by the State Game and Fish Agency. The Game and Fish Commission may set a season on buffalo, but they cannot charge for, or issue a license to take the same. A Wyoming Game and Fish report shows that bison are incompatible with present land uses, making its status as a wild animal questionable (Wyoming Game and Fish, 1973). A Wyoming Deputy State Attorney General's opinion, September 1974, classifies buffalo as livestock. However, no formal legislative action has been taken.

Physical Features of Buffalo

The buffalo is the most gregarious of all wild cattle (Cahalane, 1947; Collins, 1959). Bulls are 5½ to 6 feet high at the shoulders, and cows 5 feet but some individuals are much larger. Calves weigh 30-70 pounds at birth and mature bulls average 1600-1800 pounds; cows are smaller, weighing less than 1000 pounds, averaging 700-800 pounds (BSF&W Leaflet 212, 1965); The wood buffalo is larger. Buffalo have been reported to live 30 years or longer. Cows can breed at 2 years age but bulls usually do not breed until 3 years old. Calves are usually born during April, May or June. The gestation period of buffalo is

270 to 280 days (BSF&W leaflet 212, 1965; Collins, 1959). The breeding season is in July and August and cows may not breed every year. Single calves are normal, twins are very rare; calves may nurse for over a year. Bison reach full growth at about 8 years age (Nelson, 1965). Buffalo are polygamous and have a low reproductive potential; however, some private herds do quite well. A reproductive rate of 52% in females over 3 years of age has been reported in some wild herds (Meagher, 1970); however, others report calf crops amount to 20-25% of the total animals in a herd, but mortality the first year reduced survivors to a recruitment of 8% in a wild herd (Fuller, 1966). A ratio of 1 bull per 10 cows has been recommended to maintain satisfactory reproduction. Increases in population in wild herds are slow. The dressing percentage of buffalo has been reported at 50-54% (Halloran, 1957; BSF&W leaflet 212, 1965).

Water requirements of buffalo are not great; when water is available, they will use it daily (Nelson, 1965). They can range farther from water and can stand thirst better than cattle. Neither the quantity nor quality of water presents a serious problem; buffalo growers recommend a plentiful supply of good quality fresh water. Bison do no require water in the winter, but can thrive on snow (Novakowski, 1971).

Buffalo have a highly developed sense of smell and hearing, but eyesight is poor. They are good swimmers. Buffalo make extensive use of wallowing areas to dust for flies, and they also like to rub on trees (Nelson, 1965; Meagher, 1970); this activity can create erosion problems. Wallows average 8' diameter and 6" deep (Nelson, 1965); and are used year after year. Bison can keep groves of trees well pruned down and may destroy trees with rubbing. Bison like shade in the summer.

Buffalo eat primarily grass and grass-like plants (Nelson, 1965; Meagher, 1970). They readily consume hay and prepared livestock feeds. In the winter bison clear snow by swinging the head in a sideways motion (Meagher, 1970). They will sometimes paw snow. They winter well with sufficient forage available. Food requirements have been reported at 30 pounds of forage per day, or 900 pounds per month. In some herds, they are stocked at the basis of 1 buffalo of 1000 pounds to 1 animal unit month (AUM). A rate of 1½ AUM's per buffalo on good range has been recommended; however, where a different than grass types of forage are considered, a higher conversion ratio should be used (e.g. conversion of a browse winter sheep range to buffalo yearlong probably would require 3 or 4 AUM's per buffalo per month, or more). Therefore, a conversion from domestic sheep for 1000 buffalo in the Red Desert would probably require at least 15,000 to 30,000 AUM's of forage. The Red Desert is generally rated at 10-15 acres per AUM; to supply the estimated minimum 15,000 AUM's would require 150,000 to 225,000 acres of range plus availability of dependable water.

Bison resemble cattle in their selection of forage, and they can digest plants better than cattle (Hansen, 1971). They are almost constantly on the move in their grazing. Because of their habit of compact herding, some ranges may become denuded. Garretson (1938) lists grasses as the preferred food of bison and occasionally they ate sagebrush and other weeds; but generally they prefer the lusher swales and meadows (Meagher, 1970). A Wyoming study on sheep and antelope use in the Red Desert, showed sheep preferred grass (Severson, et al, 1968), therefore, there could be competition with buffalo.

Buffalo will readily use salt and also need minerals. Salt and water have been used to influence buffalo movements in the Henry Mountains in Utah; however, fences are generally used (Nelson, 1965).

Buffalo formerly ranged over vast areas; they are quite nomadic in their habits. Their migrations and movements may be as much from habit as from physical need (Meagher, 1970). Many habits of buffalo are almost identical with those of domestic cattle (Roe, 1951).

Diseases and Other Mortality Factors of Buffalo

Buffalo are susceptible to numerous diseases and parasites, many of which may be transmitted to or obtained from domestic livestock (Roe, 1951; Trippensee, 1948; Nelson, 1965; Meagher, 1970). Among the many diseases and parasites listed which may be factors in buffalo management are: brucellosis, leptospirosis, foot-and-mouth disease, tuberculosis, anaplasmosis, anthrax, liver fluke disease, mange, hemorrhagic septicemia, metritis, arthritis, malignant edema, arteriosclerosis, orchitis, peritonitis, lymphosarcoma, pleuritis, pyemia, pneumonia, Rocky Mountain spotted fever, renal calculi, actinobacillosis, pasteurella organism, foot rot, tularemia, scouring of calves, numerous flies, ticks and internal parasites (lungworms, liver flukes, tapeworms, common warbles). Endemic brucellosis has been a problem in most free ranging herds of bison, and attempts to control it can be very costly. Bison may be more susceptible to brucellosis than domestic cattle (Nelson, 1965). Tuberculosis has been a problem in Canada (Fuller, 1966).

Most diseases and parasites are closely related or identical to livestock diseases and infestations. In wild bison epidemic disease seems to have been unknown (Seton, 1927), although several hundred bison were lost to anthrax in the 1960's in Wood Buffalo Park Canada (Novakowski, et al, 1963).

Brucellosis is by far the most important disease in buffalo, and it has been reported from most herds. Control requires testing, vaccination and culling. Testing of livestock using range with buffalo should also accompany a brucellosis eradication program in bison (Nelson, 1965). It is presumed that bison can transmit brucellosis to cattle (Meagher, 1970), and visa versa (Nelson, 1965). Brucellosis may influence productivity of some buffalo herds, but in others it has had little effect and abortions are rare although they may have a low reproductive rate (Meagher, 1970). Most private herds are tested and managed to control brucellosis. In large free ranging herds of bison, disease problems can be uncontrollable because of the difficulty of rounding up animals for treatment (Novakowski, 1971).

Other Mortality Factors

Accidents account for some loss but winter kill is probably the main mortality factor in a wild herd unless hunted or controlled for disease (Meagher, 1970). Larger predators -- wolves, black and grizzly bear cause some predation losses to bison. Wolf predation is not considered a problem in Wood Buffalo Park (Fuller, 1966).

Buffalo Hunting

Alaska, Arizona, Colorado, Montana and Utah, have had buffalo hunting. Some hunting is allowed for buffalo in Canada outside National Parks (Novakowski, 1971). New Mexico has been attempting to establish a herd and have hunting. There has been considerable interest in hunting buffalo, but most states have experienced many problems. Utah carries on a hunt in the wild with 10 to 15 permits per year. Arizona has a closely controlled hunt on fenced ranges and harvest 80 to 100 animals on two different herds. Montana formerly hunted buffalo north of Yellowstone Park. Colorado has had buffalo hunts and have attempted to establish herds, but public pressure ended hunting. Alaska has four herds of bison; two herds are harvested sporadically through closely controlled hunts (DeLeonardis, 1971).

Management Problems

There are many management problems with buffalo. Disease is probably the principal concern to livestock interests. Buffalo thrive best where not closely confined; fencing is recommended with woven wire to a minimum height of 7 ft.; barbed wire should not be used. (BSF&W, leaflet 212, 1965). Sturdy corrals for handling are needed. Cattle and buffalo use similar forage. Buffalo are susceptible to the same wide ranges of diseases and organisms as cattle, and can crossbreed. Lack of fencing or barriers invites disease contamination from other range animals (Scott, 1971). This can result in major herd management problems with brucellosis and presents problems with adjoining livestock operations. Extensive fencing can cause problems with big game movements. Antelope cannot jump over, or crawl through most buffalo proof fences. Sixteen foot wide cattleguards are recommended to restrain buffalo (Barney and Cunningham, 1970). Two problems have been recognized in Wyoming: (1) with fences where they have propensity for going through with relative ease, (2) herding into corrals, chutes or trucks is difficult and dangerous (Kinter, 1974).

The Durham Ranches, Inc., operating a large private buffalo herd in northeastern Wyoming, pasture sheep and buffalo and do not have problems unless feeding, and then buffalo will gore or trample sheep if competing for feed (Errington, 1971). Buffalo can outrun most horses and have more endurance. Custer State Park in South Dakota indicates that buffalo will dominate a range with domestic livestock and may kill horses and domestic bulls (Broer, 1971). Bison seem to bear a grudge against horses, and will sometimes go out of their way to attack and try to gore them (Cahalane, 1947). The National Buffalo Association reports that buffalo do not get along with cattle, horses, or sheep when in close quarters or in congested areas such as a watering place (Houck, 1971). Behavior patterns of bison have been studied; the more excited behavior levels are generally indicated by the elevation of the tail (Shult, 1972).

Conflicts with people occur. Buffalo are unpredictable and have been known to attack humans. Most buffalo operations report it not advisable for people to be in the same area with buffalo. People on buffalo range could develop many problems; since buffalo are unreliable and can be dangerous (Kaschke, 1971). Most buffalo operations recommend fencing the range from domestic livestock and restricting movement of people. Yellowstone Park reported a buffalo gored to death a park visitor in 1971; they also reported injuries in 1974; an injury was also reported to a person in Colorado.

The Wyoming Stock Growers and State Livestock Sanitary Board state that buffalo are not under the brand inspection requirements of the state law, but they must comply with the state health herd requirements. These regulations require brucellosis testing for animals coming into the state.

Reactors may not be brought in nor taken out of the state. Identified carcasses of reactors can be shipped out of the state.

Conflicts with Other Uses of Federal Lands

The Red Desert range area has been adjudicated or is in the adjudication process for range livestock under the provisions of the Taylor Grazing Act. Adjustments in stocking rates have been made, and some allotments established. Much of the range is unfenced, and is utilized principally by winter sheep operations; there are some summer cattle, sheep and horse uses. All available forage is fully obligated. There are horses in parts of the Red Desert. Forage reservations have been made for wildlife and is fully utilized by existing native game animals; there is no surplus forage.

The cooperative agreement between the BLM and Wyoming Game and Fish requires written agreement before any wildlife transplants are made. Habitat requirements for the transplant species consistent with other land uses must be considered.

Summary

In analyzing information on buffalo and the Red Desert, some pertinent facts are evident.

1. Small numbers of buffalo formerly inhabited parts of the Red Desert.
2. Buffalo are susceptible to may diseases and infestations common to domestic livestock; many infestations may be transmitted from buffalo to domestic livestock and visa versa. The principal diseases of concern are brucellosis and tuberculosis. Brucellosis is endemic in most free ranging herds of buffalo; control efforts are time consuming and costly.

3. Buffalo and livestock may not be compatible on the same range, and there is competition.

4. Most buffalo operations are fenced and have provisions for handling the animals to provide for safe handling of the animals to insure disease-free herds.

5. There is considerable interest in buffalo and there are numerous herds of buffalo. At present, there are over 3,000 buffalo in Wyoming. There are reported over 30,000 buffalo in U.S. and Canada. It is felt that this number is large enough to assure their well-being in the foreseeable future. The buffalo is not threatened; many herds are handled on a commercial basis similar to a livestock operation. Brood stock is available.

6. The range carrying capacity of the Red Desert is fully obligated for domestic livestock and existing native wildlife. Establishing a buffalo range in the Red Desert would result in cancellation or reduction of domestic livestock operations and possible reduction of other native game species and horses, fencing off a considerable area, construction of adequate handling facilities, development of reliable water sources, plus regulation to harvest surplus animals. Buffalo proof fences would be obstacles to established antelope migrations in the Red Desert.

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